

PRIOR ART

Figure 1

1/11

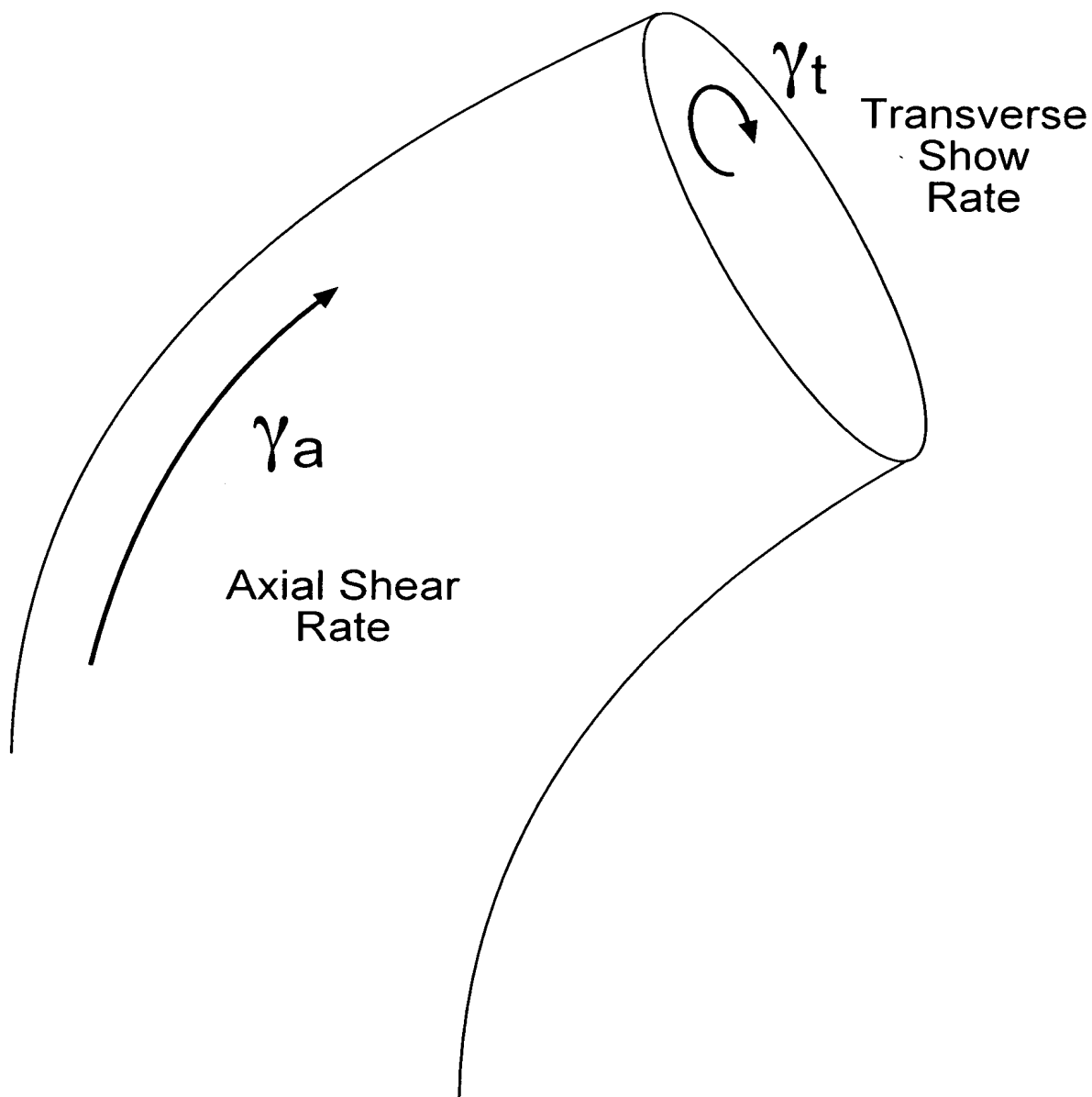


Figure 2

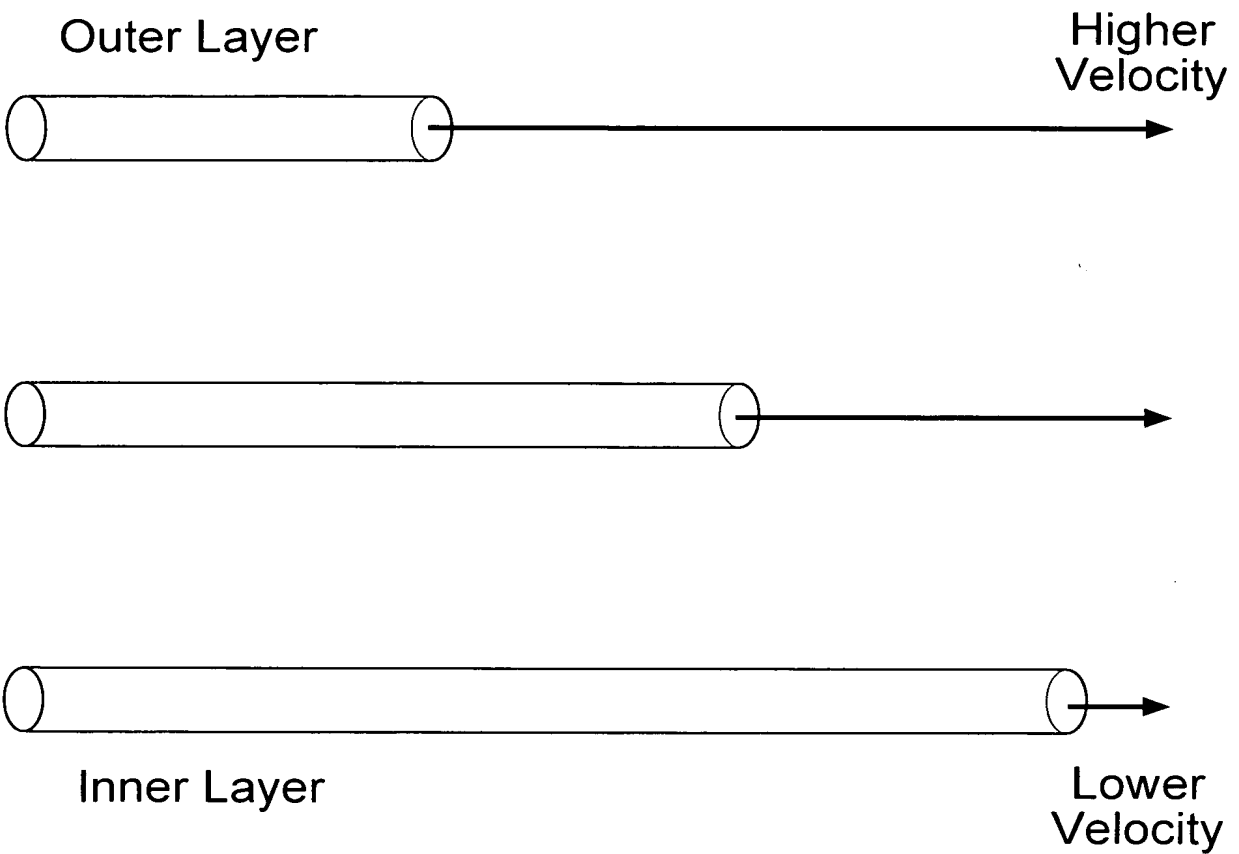
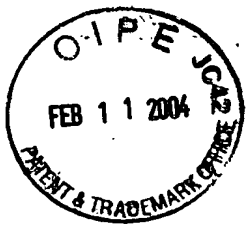


Figure 3

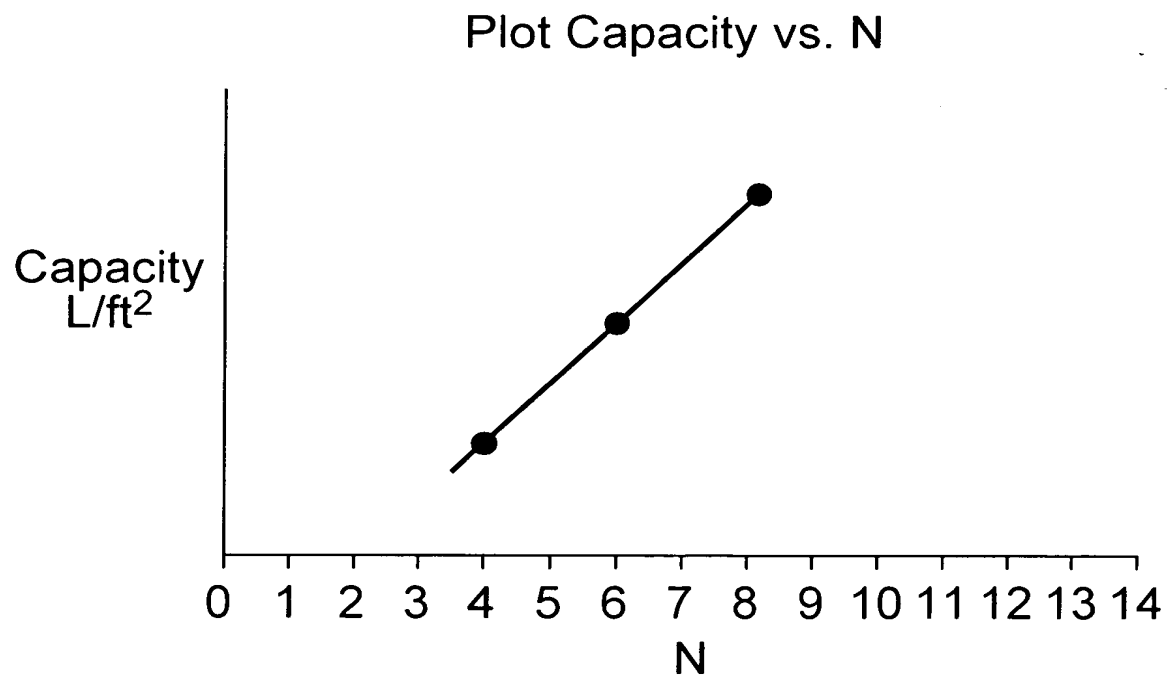


Figure 4

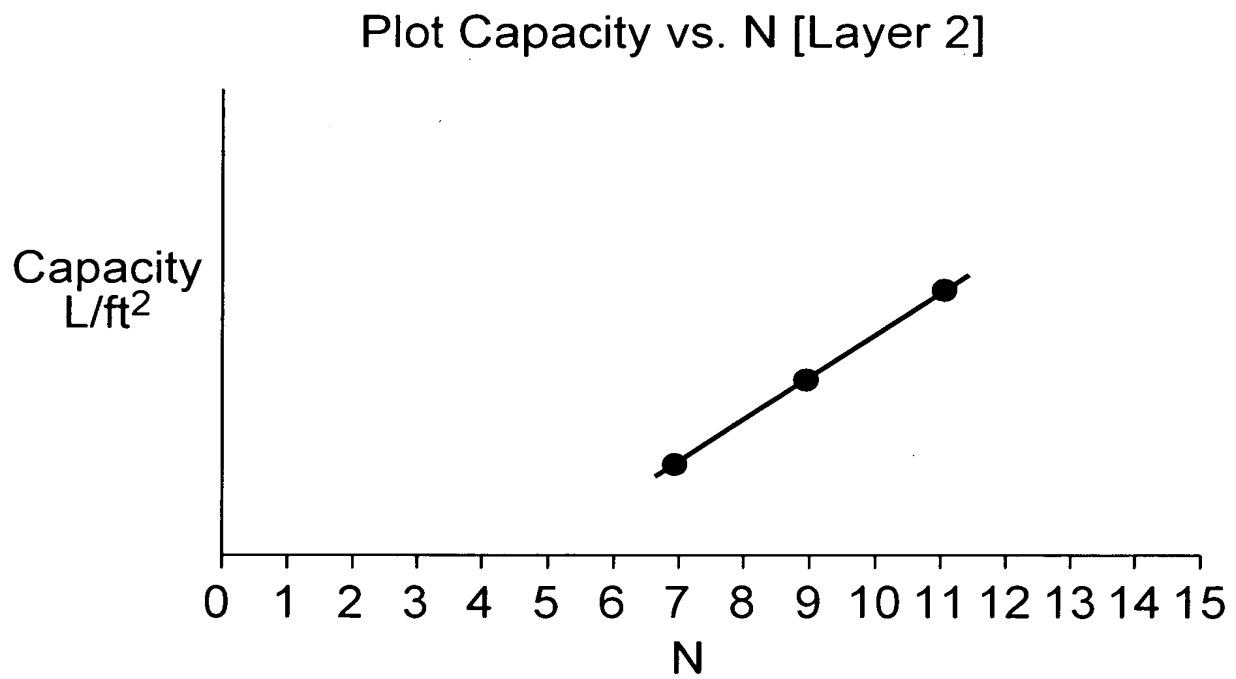
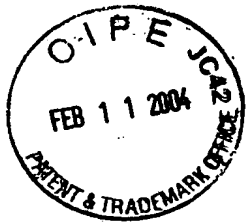


Figure 5



N	Large
31	5
23	4
17	3
11	2
6	1

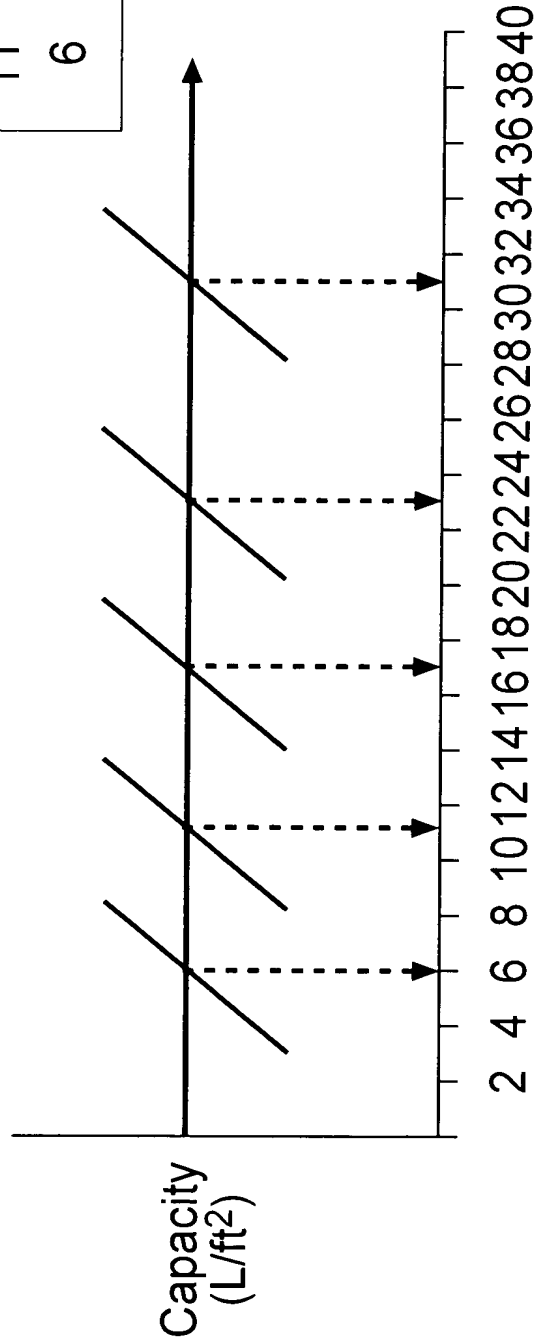
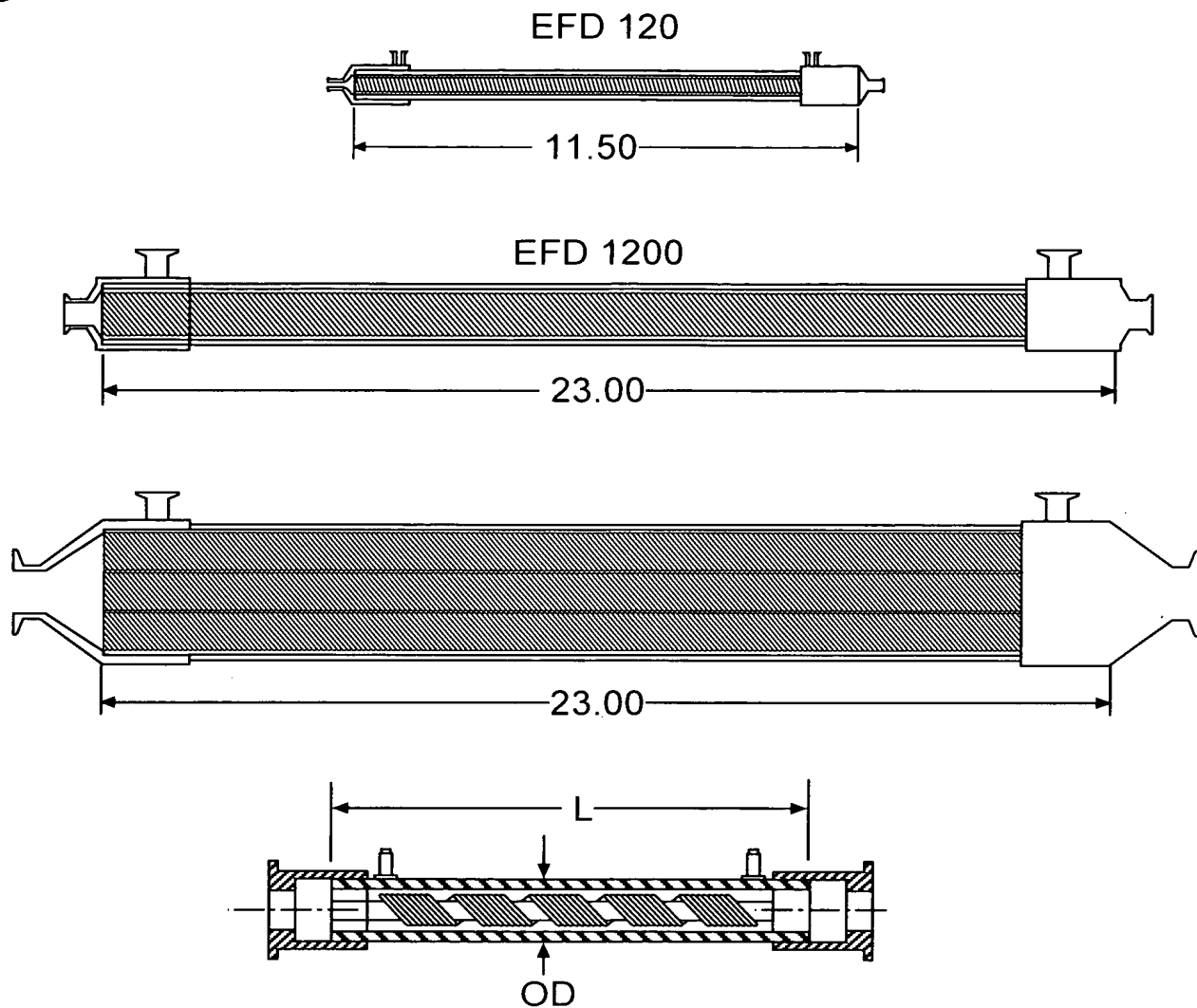


Figure 6



Type	Area	# of fiber layer	Shell Length "L"(in.)	Shell O.D. (in.)	# of fibers/ Device	Fiber Length (in)	Equiv. Dean # (@ 2psi)
Lab Scale	120 sq.cm	1	11.5	.75	4	38	203
Pilot Scale	1200 sq.cm	3	23	1.1	40	35	210
Process Scale	1 sq.cm	11	23	2.4	300	37	110
	2 sq.cm	16	23	2.9	590	37	204

\*assumes fiber 1.3mm ID xx2mm OD

Figure 7

# Experiments Demonstrating Scaling Between Laboratory and Manufacturing Scale Modules

Scale Up Experiments-Constant Flux Experiment using 0.1  $\mu\text{m}$  Fiber, 130  $\text{cm}^2$  and 5 $\text{Ft}^2$  EFD at  $\Delta P$  (feed channel) 4 psi and Flux 20 l/mh using Synthetic Solution (2% BSA, 0.2% RNA and 0.5% Dextran in 0.1M Sodium Acetate Buffer of pH:5)

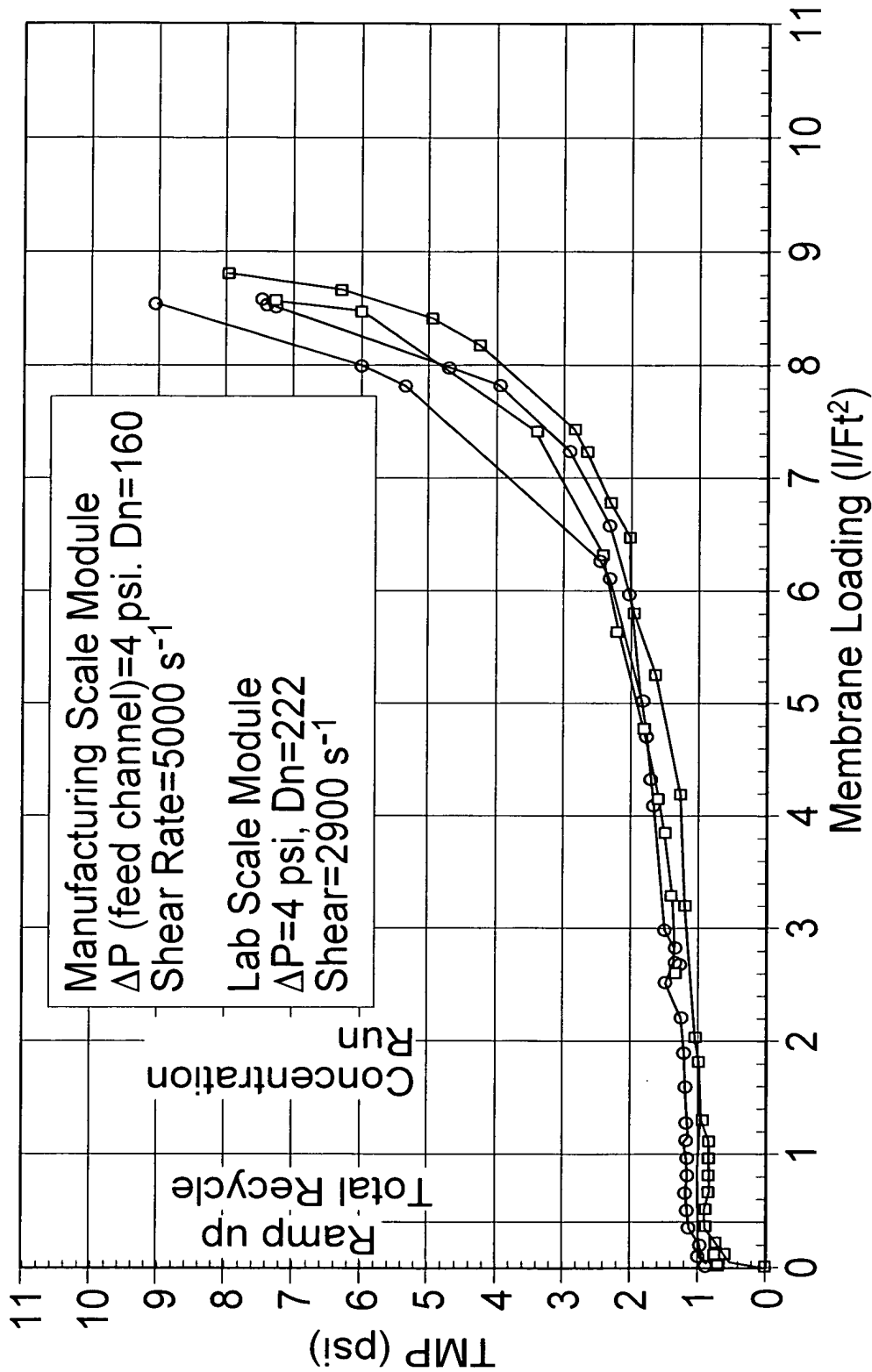
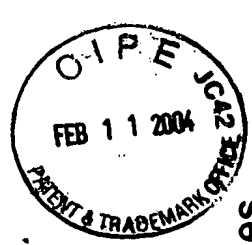


Figure 3B





EFD Module Designs

Section View

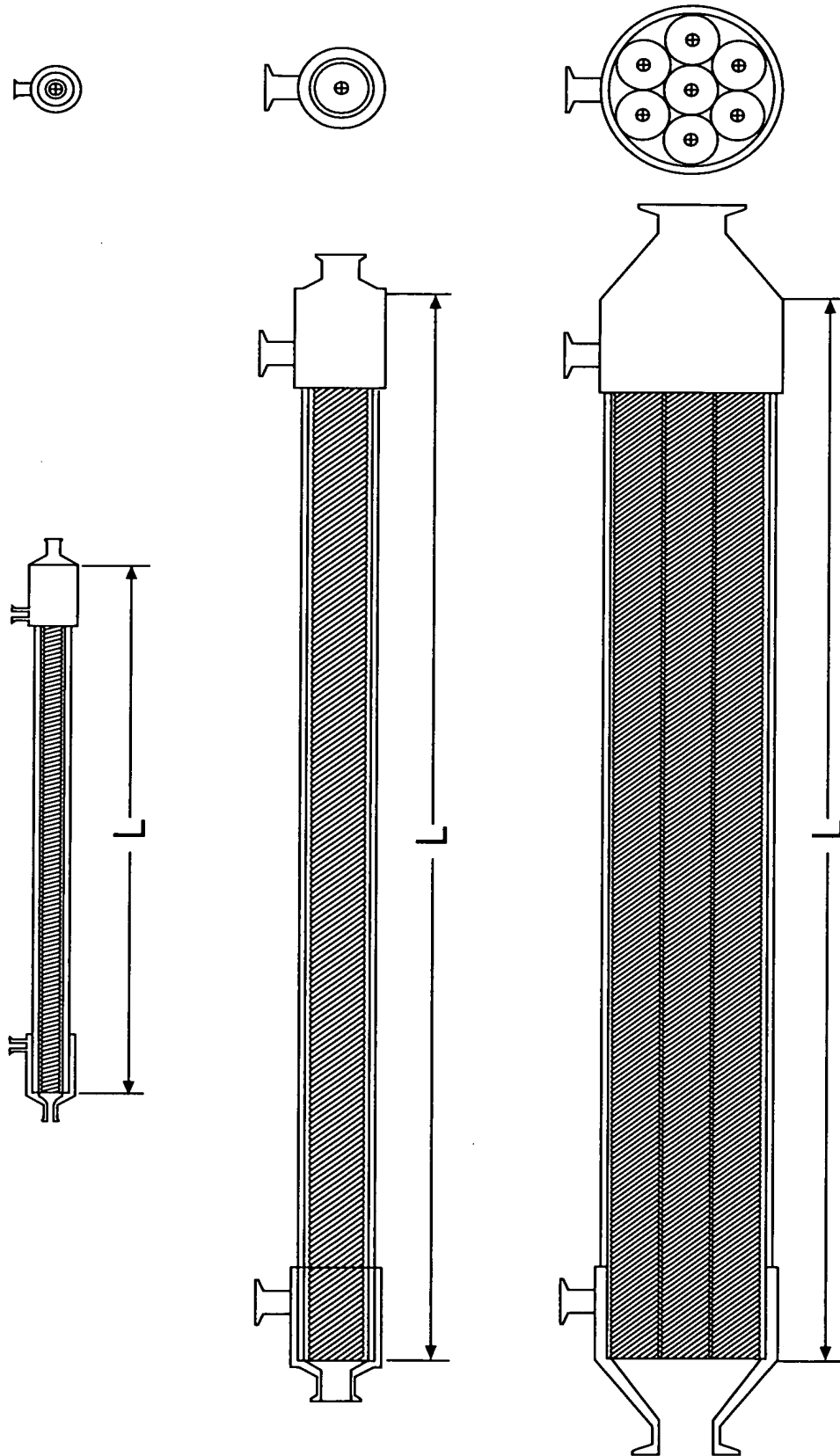


Figure 9

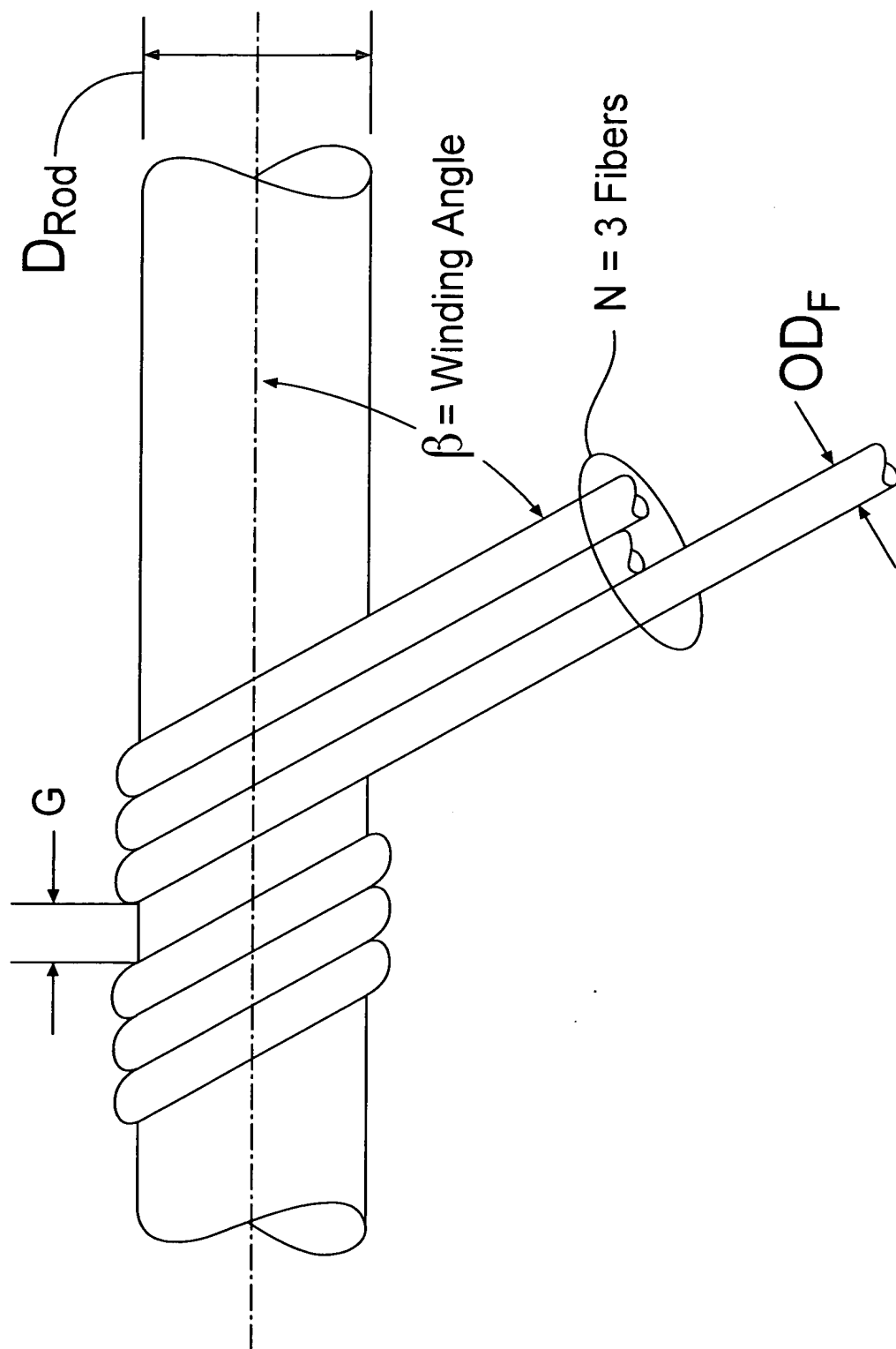


Figure 10

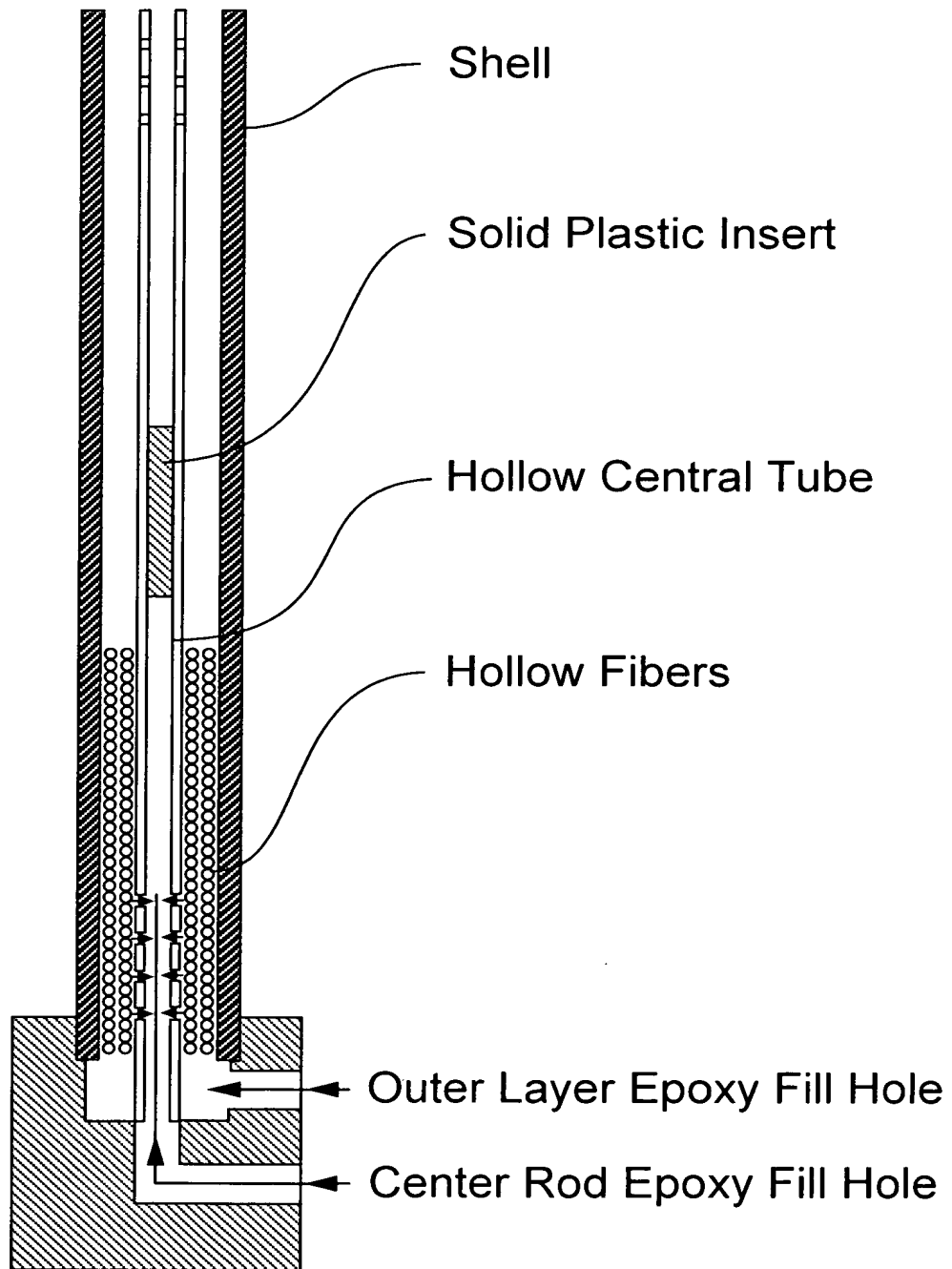


Figure 11